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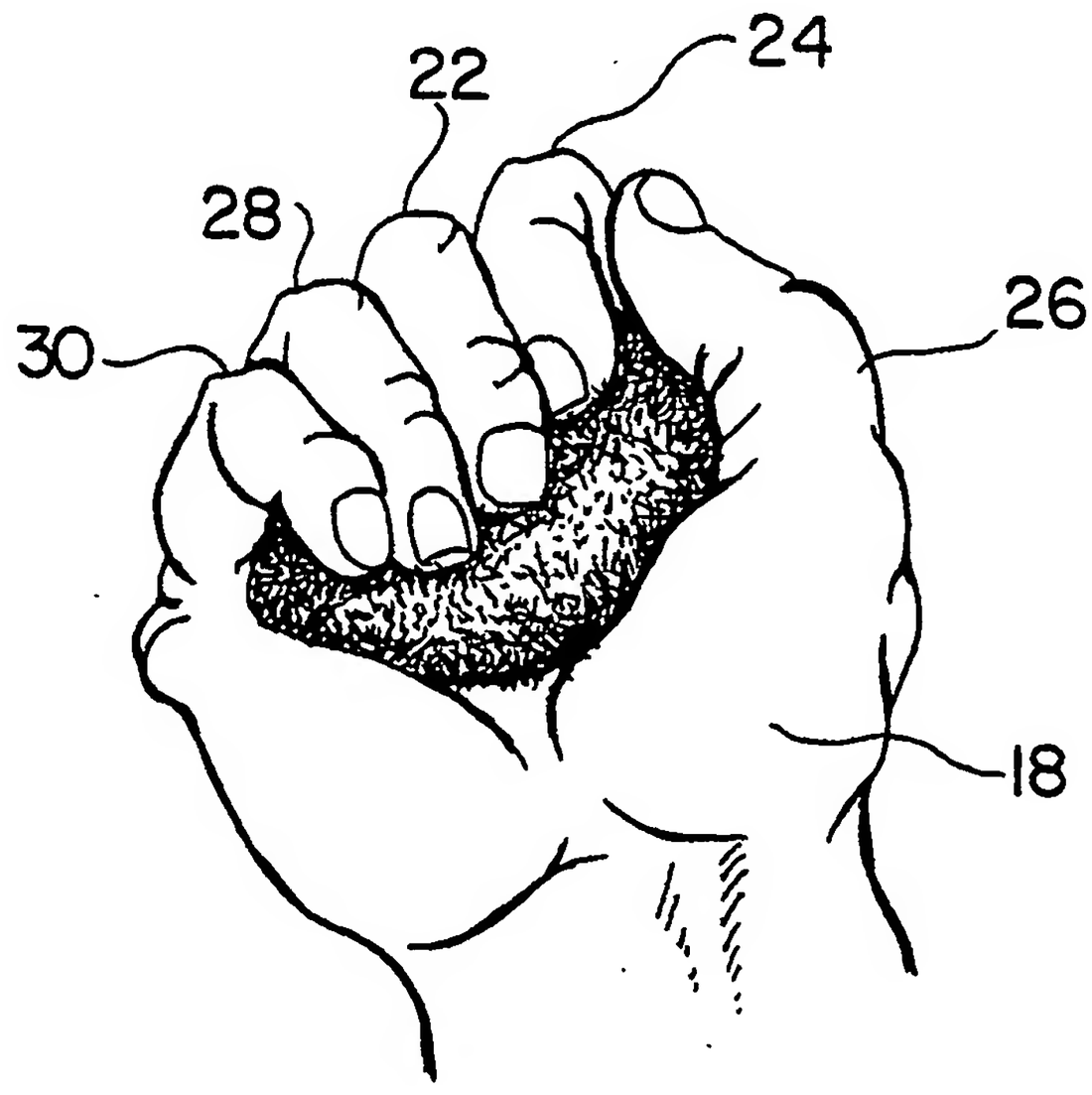
(54) Title: EXERCISE DEVICE

(57) Abstract

An exercise device for the hands. More specifically the device comprises a resilient "egg shaped" body (10) adapted for squeezing with the fingers (22, 24, 28, 30), to exercise the hand (18). Flocking (36) may be applied to the exterior surface of the body (10) to improve its appearance and feel.



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Exercise Device

BACKGROUND OF THE INVENTION

Field of the Invention

The invention relates to exercise devices and more specifically to an exercise device for the hand and arms.

DESCRIPTION OF THE PRIOR ART

Various prior art devices are available for exercising the muscles of the hand and arm. Such devices range from spring operated squeeze devices to various shaped bodies of elastic materials. For example, tennis balls have been used as hand exercise devices. The effectiveness and ease of use of such prior art devices is determined by the extent to which such devices complement the natural shape and function of the hand.

For example, tennis balls have the characteristics that the spherical outer surface does not complement the natural form of the hand. As a result, the little and first finger contact the surface at an angle tending to cause these fingers to slip as the ball is squeezed.

Additionally, it is desirable that exercise devices of this type be easy to carry so they may be utilized during spare moments which might otherwise be wasted.

Factors which must be considered in selecting an exercise device which complements the human hand include the structural complexity of the hand and the associated muscles. If the exercise device is to be squeezed, it is preferable that the device permit the fingers of the hand to be positioned in their natural position. This requires that each of the fingers be closed (curved) by substantially the same amount. Additionally, it is preferable that the thumb not or unreasonably interfere with the fingers. Surface treatments, such as flocking, may be utilized to produce outer surfaces having the desired physical and aesthetic properties.

SUMMARY OF THE INVENTION

The exercise device which is the subject of this invention complements the natural contours of the human hand and provides an effective mode of exercise. Additionally, the exercise device is easy to transport. For example, the exercise device may be carried in the pockets of men's trousers or in ladies' purses.

The preferred embodiment of the invention comprises a body of elastic material, such as foam rubber, having a curved outer surface. The curved outer surface has a curvature which compliments the structure of the human

hand. More specifically, the body of material is generally "egg-shaped" with the larger end portion complementing the thumb portion of the hand while the smaller portion complements the remainder of the human hand.

More specifically, a first embodiment of the invention includes a body of elastic material including a selectively curved outer surface and having a major axis and a minor axis; the major axis coincides with the maximum cross-sectional diameter of the body of elastic material, the minor axis coincides with the maximum cross-sectional diameter of the body of material in a plane perpendicular to the major axis; the body includes first and second portions defined by a plane passing through the minor axis and perpendicular to the major axis; the outer curved surface of said first portion having a selectively varying curvature with the maximum curvature corresponding to a region adjacent to the major axis; the outer surface of said second portion having a selectively varying curvature with the maximum curvature corresponding to a region adjacent the major axis; the maximum curvature of said first and second portions being different. Generically, this results in a generally "egg shaped device".

The exercise device can be constructed in various sizes with the relative dimensions adjusted for differences in the human hand. Best results are normally achieved when the dimensions are selected such that a line passing

through the tips of the first and little finger is substantially parallel the major axis of the device with the tips of the second and ring finger spaced from the palm of the hand. Additionally, all fingers should extend around the device a distance equal to more than one half the circumference of the device.

Alternatively the invention may be described as a body of elastic material which includes a curved outer surface, symmetrical about its major axis and asymmetrical about its minor axis; the body including first and second generally dome-shaped portions defined by a plane passing through the minor axis and perpendicular to the major axis; selected regions of the outer curved surface of the first and second portions are being selectively contoured thereby rendering the body asymmetrical about the minor axis.

The above embodiments of the invention, illustrate the salient structural characteristics of the invention. Each of these illustrative embodiments include a central portion having a larger circumference than the differently contoured curved end portions. The central and end portions may be individually contoured to complement different portions of the hand. Additionally the contoured outer surface complements the natural form of the human hand, as subsequently described in detail.

DESCRIPTION OF THE DRAWINGS

Figure 1 is an isometric drawing illustrating the invention.

Figure 2 is a pictorial drawing illustrating the use of the invention.

Figure 3 is a cross-sectional view of the device along a plane parallel to the major axis.

DETAILED DESCRIPTION

Figure 1 is a pictorial drawing illustrating the preferred embodiment of the invention. This embodiment includes a body of elastic material 10 which has an outer curved surface which is generally "egg-shaped". As with all bodies of this general shape, the body includes a major axis 12 which coincides with the maximum cross-sectional diameter of the body. Similarly, a minor axis 14 corresponds to the maximum cross-sectional diameter in a plane perpendicular to the major axis 12. Generically, the body of elastic material 10 can be accurately described as "egg shaped". Experiments have demonstrated and the drawings illustrate that this shape complements the natural form of the closed human hand, as subsequently described in detail.

Alternatively, the body of elastic material 10 may be described as an elongated body symmetrical about its major axis and asymmetrical about its minor 14 axis. As discussed below and illustrated in Figure 2, the end portions of the body of material 10 adjacent the major axis has little contact with the hand during use. This permits these regions to have any reasonable contour. In the most general case, the end portions of the preferred embodiment can be accurately described as "dome shaped". However, if desired, more complex surfaces may be used, For example, a groove could be included to complement the fingers or the thumb. Such complicated structures, while feasible, are not believed to functionally improve the device sufficiently to justify the increased complexity.

Alternatively, the central and end portions may be contoured individually to complement the different portions of the hand. In such a case, the device is not necessarily symmetrical about the major axis. While functional, the preferred embodiments of the invention are symmetrical about the major axis, as described above.

In use, the exercise device is intended to be held in the hand and repetitively squeezed and released. To illustrate this mode of use, the preferred embodiment of the exercise device is illustrated in Figure 2 as held in a human hand 18. As can be seen from this figure, the second finger 22 generally curves around the exercise

device in an area which is near its maximum circumference around the device. Similarly, the first finger 24 curves around the larger end of the device permitting the thumb 26 to extend over the end. Similarly, the ring finger 28 and the little finger 30 curve around the end portion having a smaller diameter. Additionally, it should be noted that the central portion of the exercise device is positioned in the palm of the hand. This being the case, the generally egg-shaped outer surface of the exercise device is particularly advantageous in that it complements the natural shape of the human hand permitting all portions of the hand to be conveniently exercised by alternately squeezing and releasing the devise.

Figure 3 is a cross-section of the Exercise device along a plane parallel to the major axis 12. In the preferred embodiment, the exercise device includes an inner portion 34 of material such as rubber and an outer layer 36 which is preferably soft and fibrous, leading to a device which is aesthetically pleasing and comfortable to use. The relative dimensions can be changed to increase the elongation of the device. Such a structure can be conveniently formed by simply molding the inner body of the desired material and then applying conventional flocking to the exterior surface.

The exercise device which is the subject of this invention can be easily varied for individuals having varying degrees of physical strength as well as physical

size. To conform to human hands of various sizes, it is simply necessary to form the egg-shaped bodies such that it is smaller or larger as desired. The elasticity constant of the material can be varied to change the rigidity of the device. Additionally, the device may be made in various colors to specifically appeal to individuals of varying taste. Promotional messages may be printed on the exterior surface permitting the device to be used as a promotional device for various businesses.

The invention has been described above with reference to a preferred embodiment; however, it will be appreciated by those skilled in the art that many variations of the basic invention can be made, all of which are within the concept of the invention. For example, various materials may be used to form the major body of the device and various external treatments may be utilized. Additionally, some contour modifications in the outer surface are possible; however, it is believed that the smooth continuously changing radius of curvature disclosed is the most efficient embodiment of the invention.

As can be seen from the above discussion, there is little or no contact between the hand and the regions of the smaller end portion near the major axis 12. This feature permits this region to have any convenient contour. Also, contact between the hand and regions of the larger end near the major axis 12 is limited to the thumb. Although

it complicates the design, it is also possible to incorporate indentations in the larger end which complement the thumb. Additionally, the contour of the central portions may be modified to include grooves for the fingers. The salient feature of all of these embodiments is to contour the outer surface of the device to complement the features of the hand, with the generally egg-shaped form believed to be the best embodiment. Advantages of the egg-shaped design include its simplicity and non-critical size. However, the size may be scaled for use by individuals ranging from children to adults. Additionally, contact between the hand and the larger end portion in a region near the major axis is primarily with the thumb. This feature also reduced the importance of the contour of the large end in regions adjacent the major axis. However, when all factors are considered, the generally egg shaped structure is the preferred embodiment of the invention.

The exercise device described above may be made using a wide variety of manufacturing processes and techniques. For example, the body may be molded of any material having suitable elastic properties. The outer surface may be coated using conventional flocking processes. Alternatively, the body may be hollow and gas filled to give it the desired elastic properties.

Claims

1. An exercise device comprising:
a. a body of elastic material including a selectively curved outer surface and having a major axis and a minor axis, said major axis coinciding with the maximum cross-sectional diameter of said body of elastic material, said minor axis coinciding with the maximum cross-sectional diameter of said body of material in a plane parallel to said major axis, said body including first and second portions defined by a plane passing through said minor axis and perpendicular to said major axis, the outer surface of said first portion having a selectively varying curvature with the maximum curvature corresponding to a region adjacent said major axis, the outer surface of said second portion having a selectively changing curvature with the maximum curvature corresponding to regions adjacent said major axis, the maximum curvature of said first and second portions being different.

2. An exercise device in accordance with Claim 1 wherein said body of elastic material is molded rubber.

3. An exercise device in accordance with Claim 2 wherein the outer surface of said body is coated with fibers.

4. An exercise device comprising:

a. a body of elastic material including a curved outer surface symmetrical about its major axis and asymmetrical about its minor axis, said body including first and second generally dome-shaped portions defined by a plane passing through said minor axis and perpendicular to said major axis, selected regions of the outer curved surface of said first and second portions selectively contoured thereby rendering said body asymmetrical about said minor axis.

5. An exercise device comprising:
a body of elastic material including a selectively curved central portion having a circumference complementing the reach of the second finger of the human hand, a first end portion extending outwardly from said central portion and contoured to complement the first finger and thumb portion of the human hand, a second end portion also extending outwardly away from said central portion and contoured to complement the ring and little finger portion of the human hand.

6. An exercise device in accordance with Claim 5, wherein said body of elastic material includes a major and a minor axis with said body of elastic material being symmetrical about said major axis and asymmetrical about said minor axis.

7. An exercise device in accordance with Claim 6 wherein said body of elastic material is coated with a fibrous material.

8. An exercise device in accordance with Claim 7 wherein said body of elastic material includes an interior cavity.

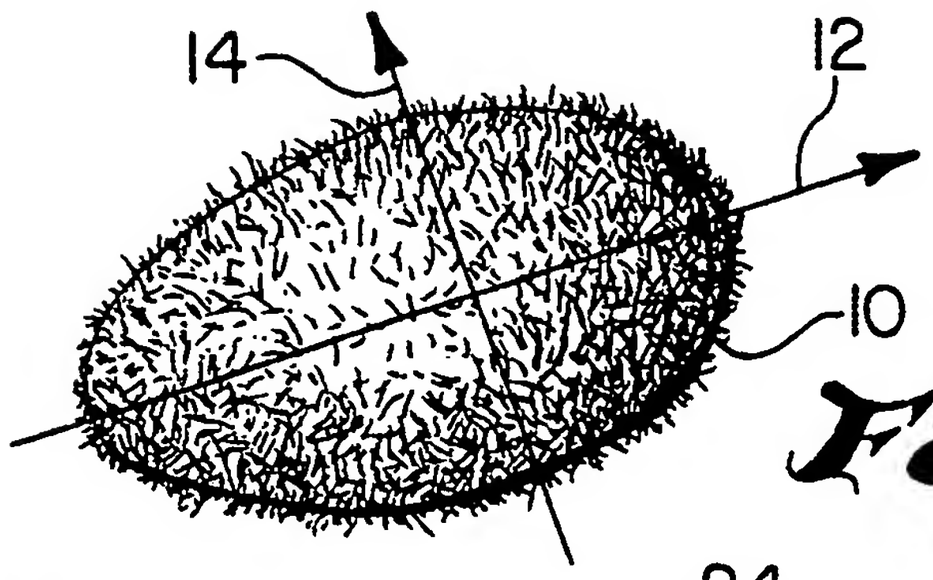

Fig. 1

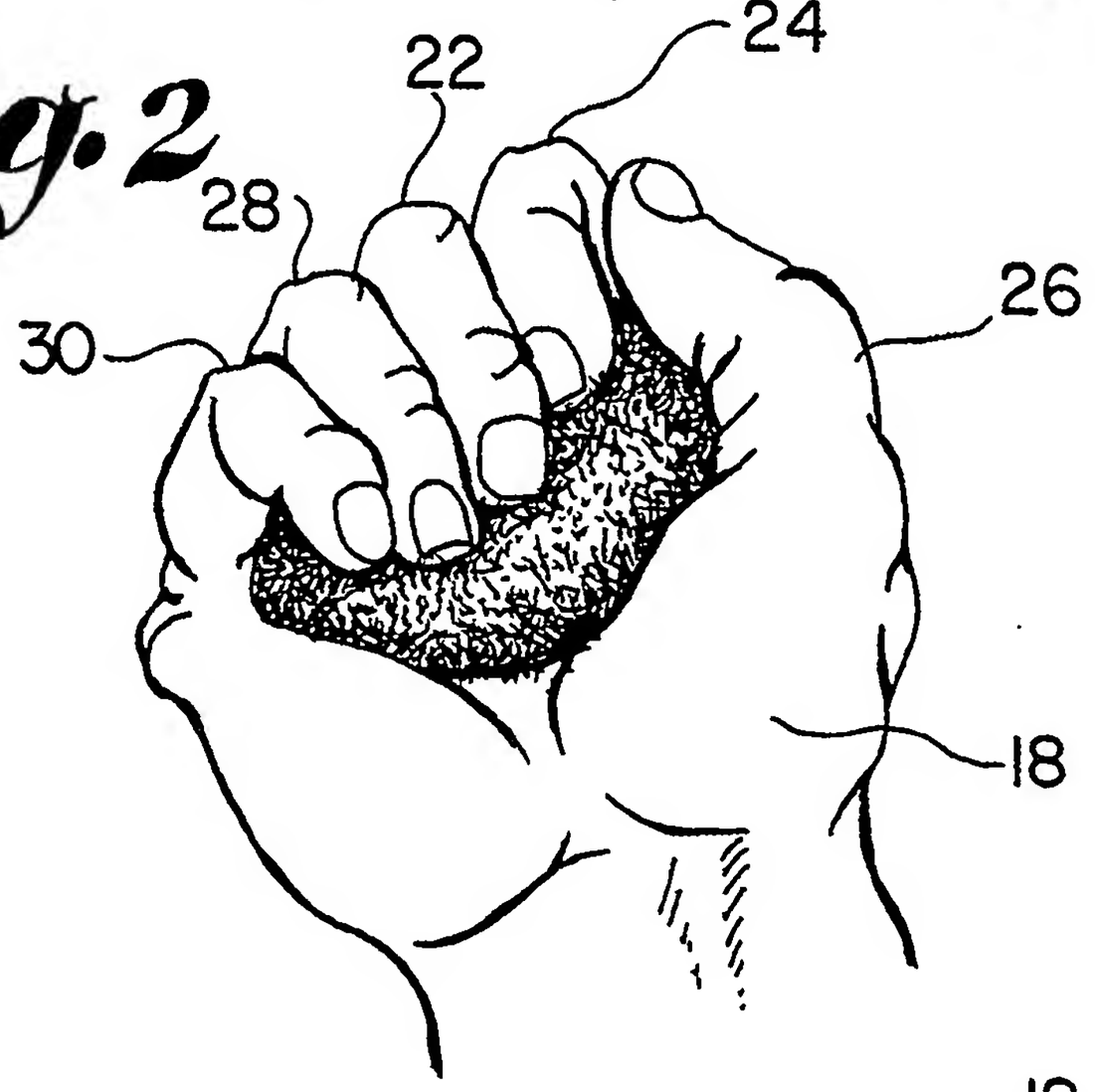

Fig. 2

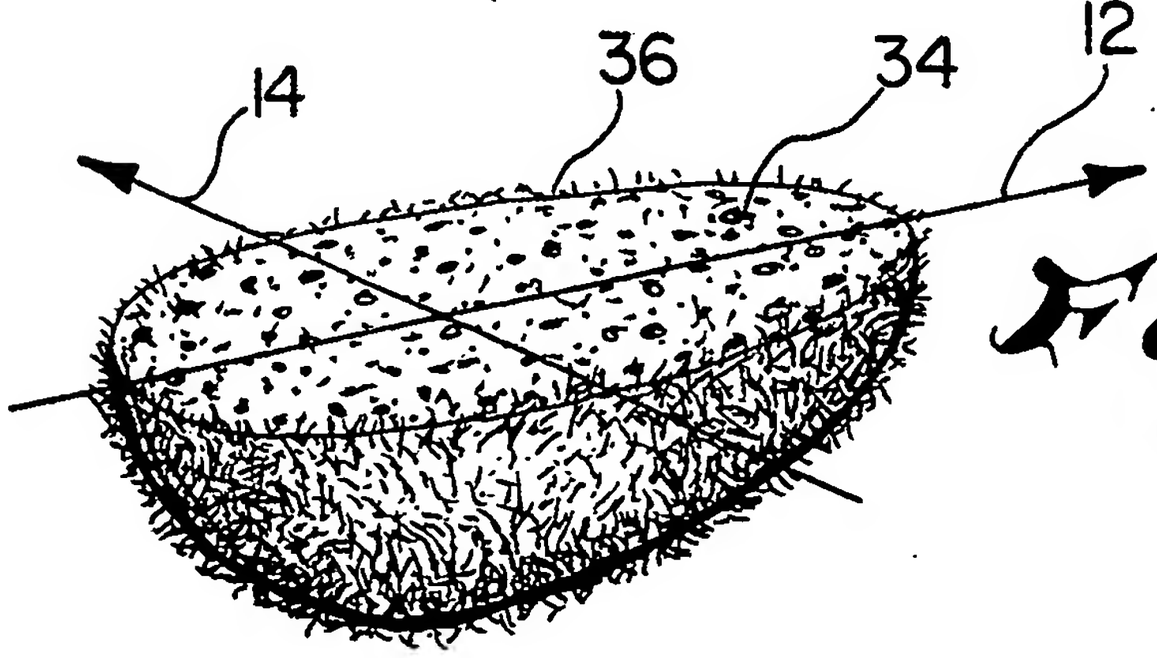

Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No PCT/US90/03815

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 3

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC(5) A63B 21/00
US CL 272/67

II. FIELDS SEARCHED

Minimum Documentation Searched 4

Classification System	Classification Symbols
U.S	272/67,68; 273/72R

Documentation Searched other than Minimum Documentation
to the Extent that such Documents are Included in the Fields Searched 5

III. DOCUMENTS CONSIDERED TO BE RELEVANT 14

Category *	Citation of Document, 16 with indication, where appropriate, of the relevant passages 17	Relevant to Claim No. 18
Y	US, A, 3,413,243 (GRIFFIN) 26 November 1968 See figure 1.	1-4
Y	US, A, 3,542,363 (BISHOP) 24 November 1970 See figure 1,2.	1,2,4-6
Y	US, A, 4,012,039 (YERKE) 15 March 1977 See figure 2.	3,7

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IV. CERTIFICATION

Date of the Actual Completion of the International Search 2	Date of Mailing of this International Search Report 2
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International Searching Authority 1	**Signature of Authorized Officer** JEFFREY NGOC-HO
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